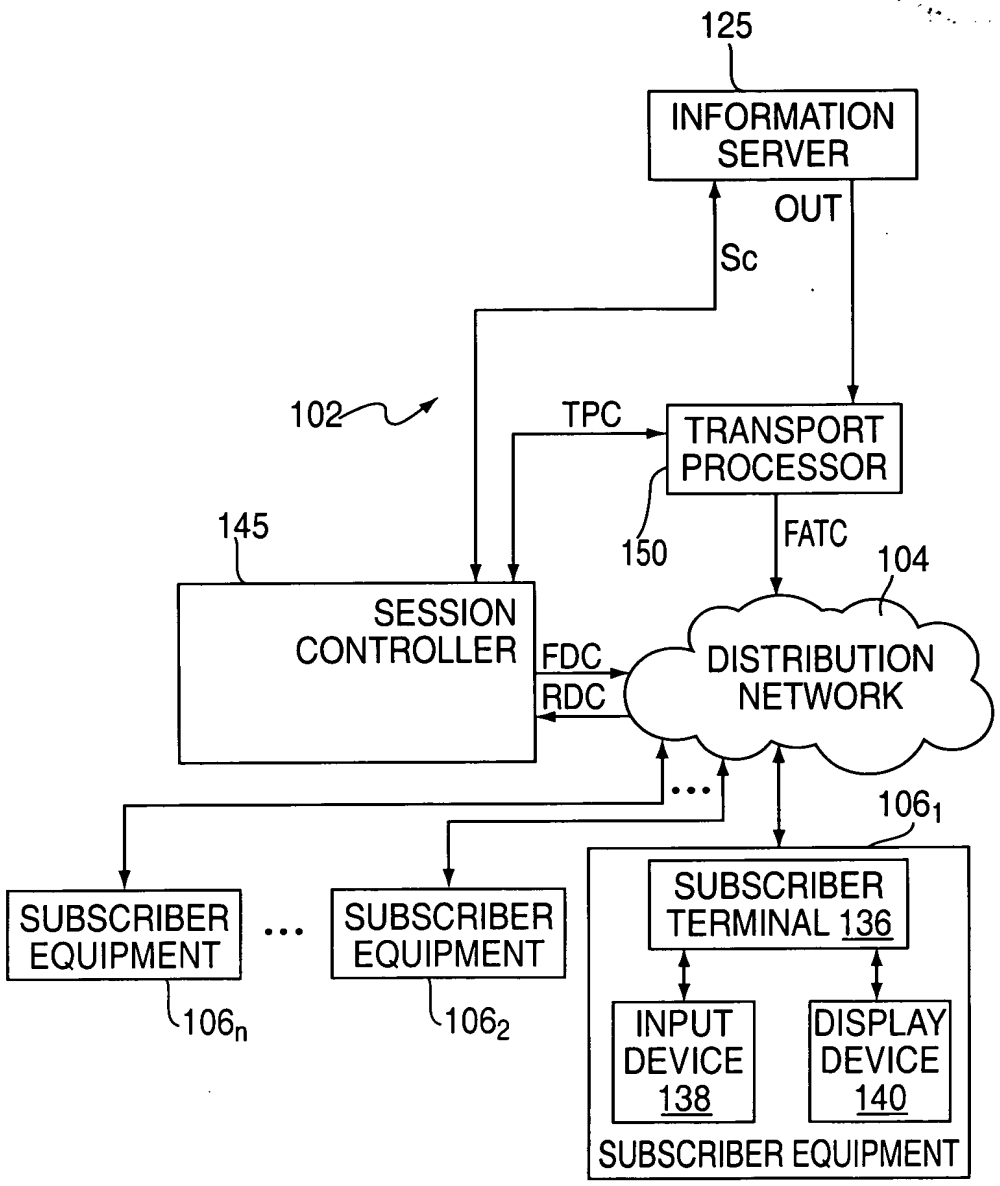
125
INFORMATION SERVER
OUT
Sc
102
TPC
TRANSPORT PROCESSOR
145
150
FATC
104
SESSION CONTROLLER
FDC
RDC
DISTRIBUTION NETWORK
...
106_1
SUBSCRIBER EQUIPMENT
...
SUBSCRIBER EQUIPMENT
SUBSCRIBER TERMINAL 136
INPUT DEVICE 138
DISPLAY DEVICE 140
SUBSCRIBER EQUIPMENT
106_n
106_2

FIG. 1

PCT/US98/26760

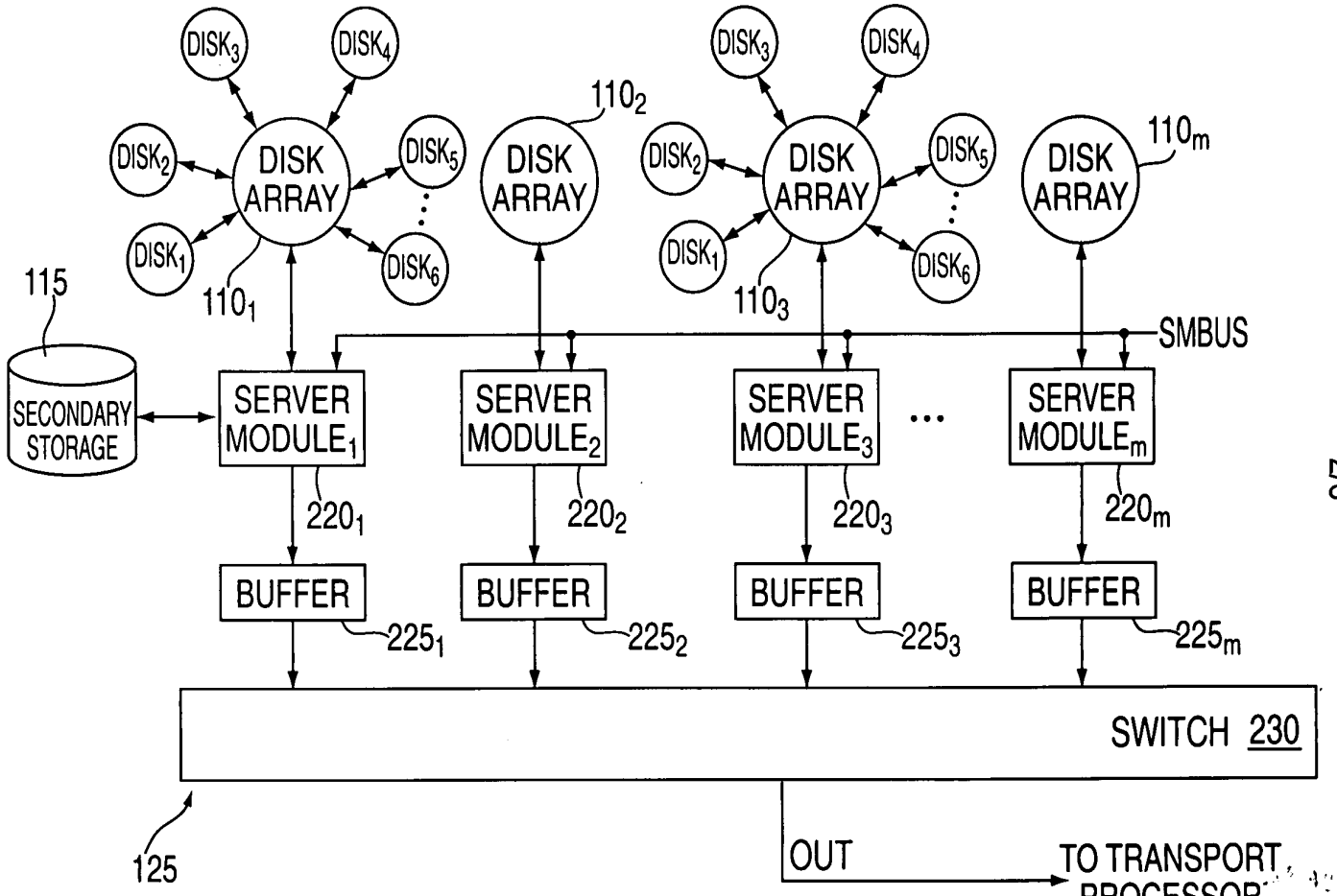

FIG. 2

SERVER MODULE #	(SOURCE) 1	(DESTINATION) 3
DISK #	0 1 2 3 4 5	0 1 2 3 4 5
EXTENT #	0 → [1] → [2] → ③ → 4 5 → 6 → 7 → 8 → 9 → 10 11 → 12 → • • •	0 → [1] → [2] → ③ → 4 5 → 6 → 7 → 8 → 9 • • •

310
320
330

FIG. 3A

[1] = STREAMED EXTENT

[2] = PRESENTLY BEING ACCESSED EXTENT

③ = NEXT EXTENT TO BE READ

$t < t_{n-1}$

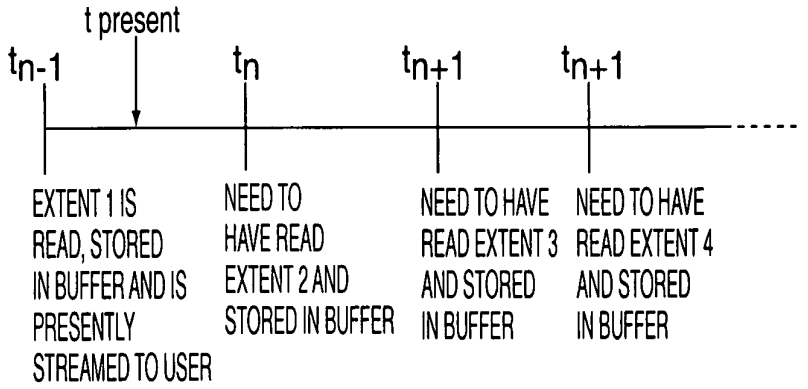

FIG. 3B

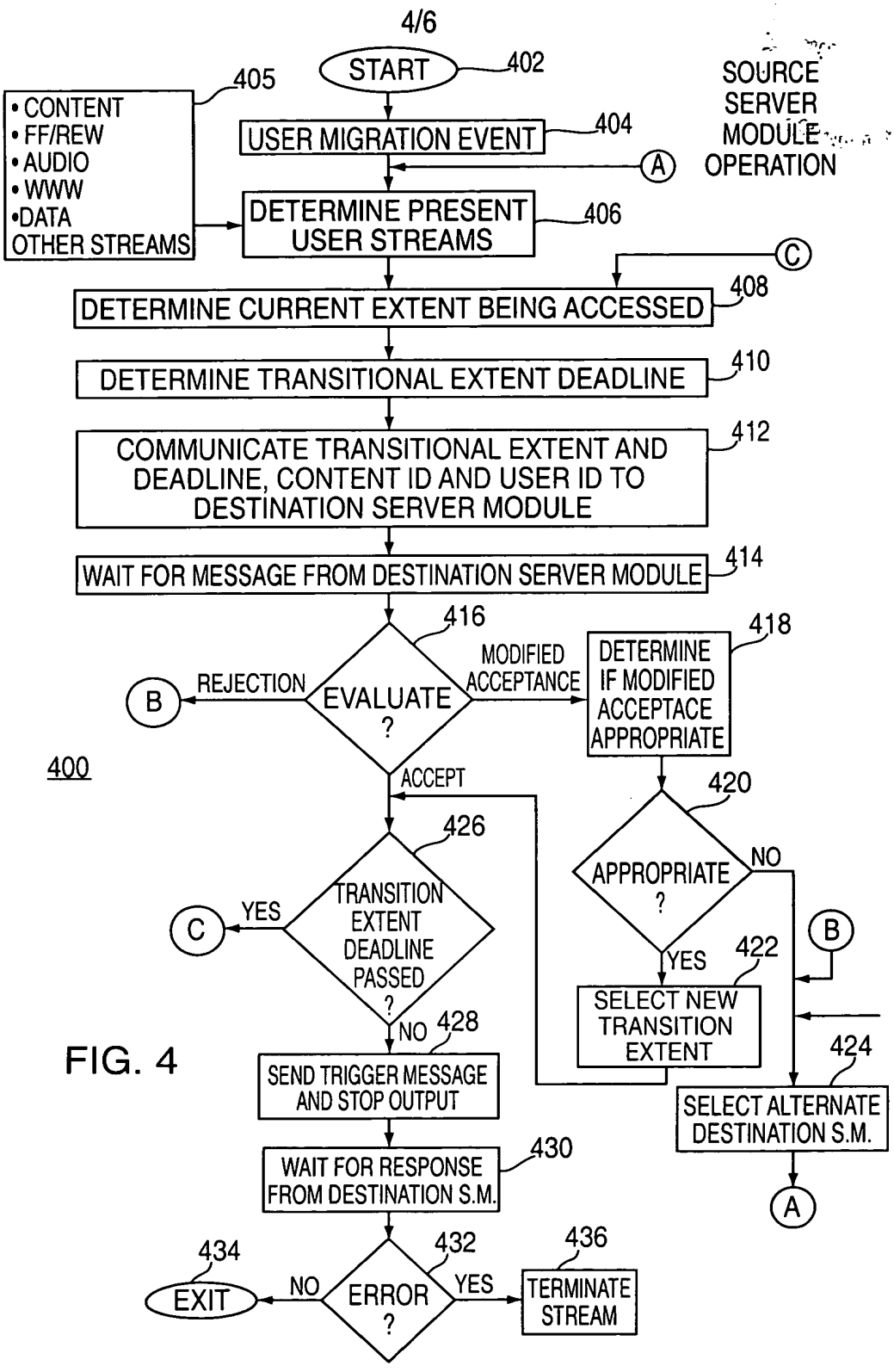
START
402
405
• CONTENT
• FF/REW
• AUDIO
• WWW
•DATA
OTHER STREAMS
USER MIGRATION EVENT
404
A
SOURCE SERVER MODULE OPERATION
DETERMINE PRESENT USER STREAMS
406
C
DETERMINE CURRENT EXTENT BEING ACCESSED
408
DETERMINE TRANSITIONAL EXTENT DEADLINE
410
COMMUNICATE TRANSITIONAL EXTENT AND DEADLINE, CONTENT ID AND USER ID TO DESTINATION SERVER MODULE
412
WAIT FOR MESSAGE FROM DESTINATION SERVER MODULE
414
416
EVALUATE ?
REJECTION
B
MODIFIED ACCEPTANCE
418
DETERMINE IF MODIFIED ACCEPTACE APPROPRIATE
400
ACCEPT
420
APPROPRIATE ?
NO
YES
422
SELECT NEW TRANSITION EXTENT
B
426
TRANSITION EXTENT DEADLINE PASSED ?
C
YES
NO
428
SEND TRIGGER MESSAGE AND STOP OUTPUT
424
SELECT ALTERNATE DESTINATION S.M.
A
WAIT FOR RESPONSE FROM DESTINATION S.M.
430
434
EXIT
NO
ERROR ?
432
YES
436
TERMINATE STREAM

FIG. 4

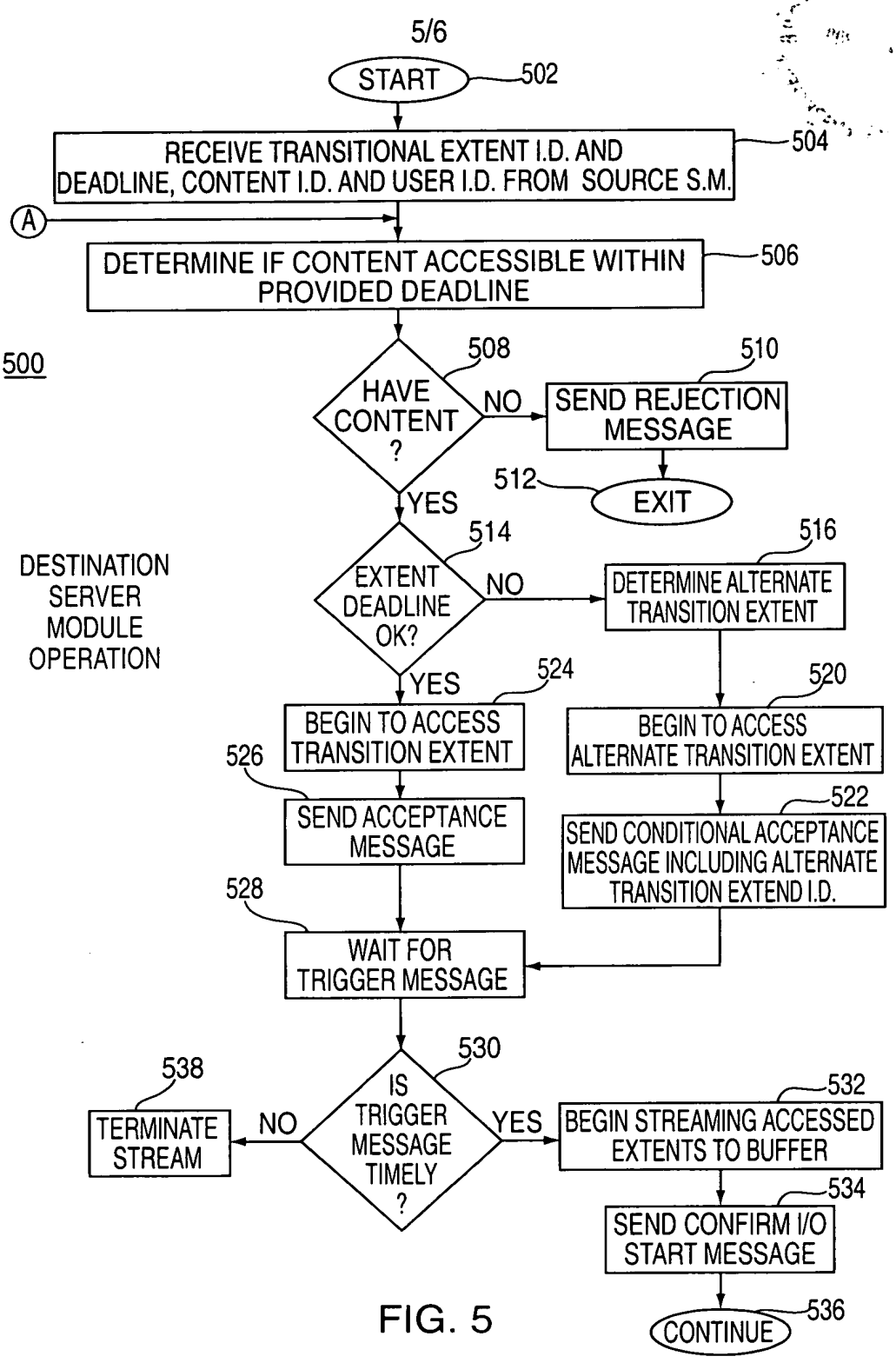
START
502
RECEIVE TRANSITIONAL EXTENT I.D. AND DEADLINE, CONTENT I.D. AND USER I.D. FROM SOURCE S.M.
504
A
DETERMINE IF CONTENT ACCESSIBLE WITHIN PROVIDED DEADLINE
506
500
HAVE CONTENT ?
508
NO
SEND REJECTION MESSAGE
510
EXIT
512
YES
DESTINATION SERVER MODULE OPERATION
EXTENT DEADLINE OK?
514
NO
DETERMINE ALTERNATE TRANSITION EXTENT
516
YES
BEGIN TO ACCESS TRANSITION EXTENT
524
BEGIN TO ACCESS ALTERNATE TRANSITION EXTENT
520
526
SEND ACCEPTANCE MESSAGE
SEND CONDITIONAL ACCEPTANCE MESSAGE INCLUDING ALTERNATE TRANSITION EXTEND I.D.
522
528
WAIT FOR TRIGGER MESSAGE
IS TRIGGER MESSAGE TIMELY ?
530
538
TERMINATE STREAM
NO
YES
BEGIN STREAMING ACCESSED EXTENTS TO BUFFER
532
SEND CONFIRM I/O START MESSAGE
534
CONTINUE
536

FIG. 5

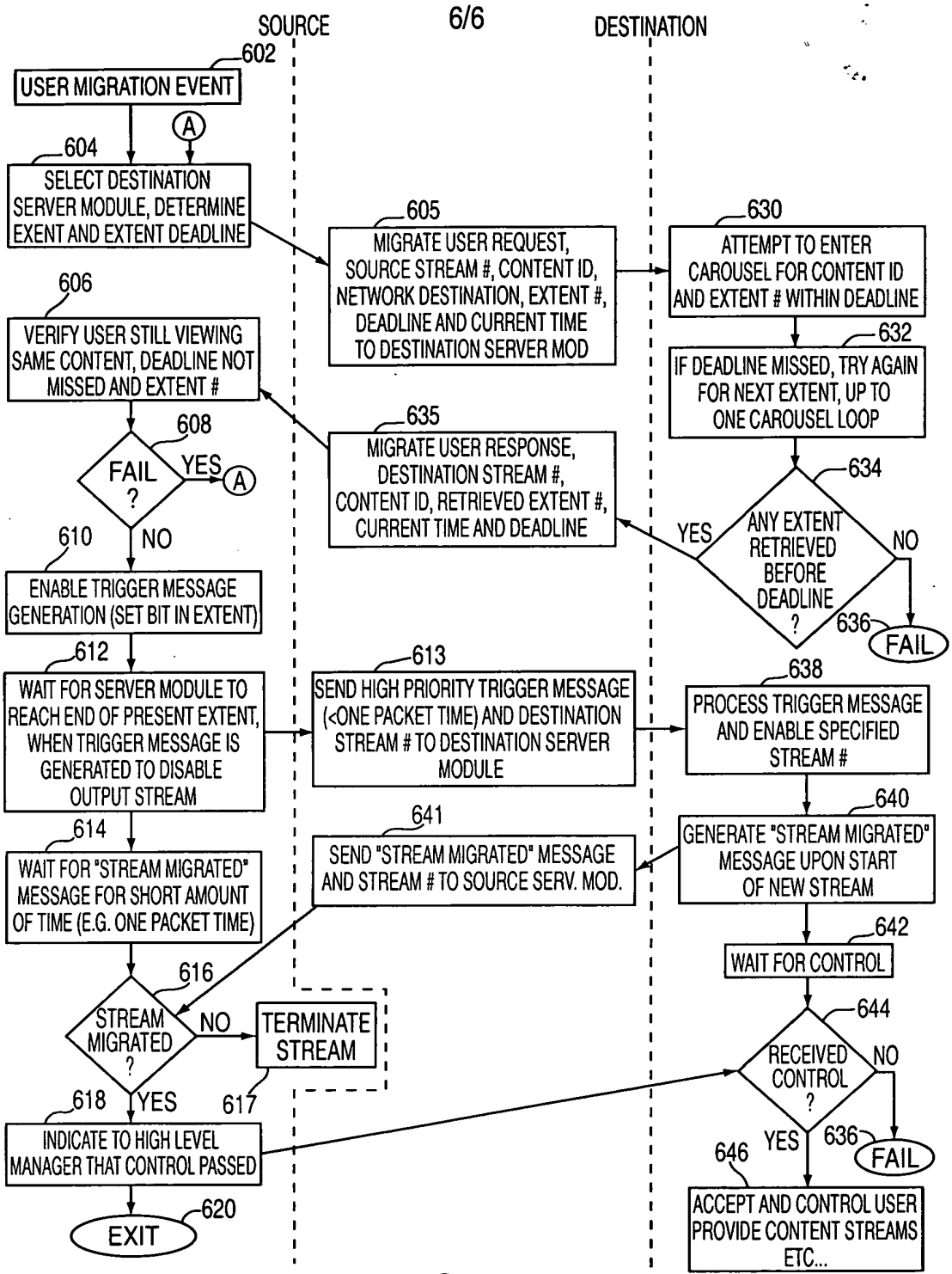
SOURCE
DESTINATION
602
USER MIGRATION EVENT
A
604
SELECT DESTINATION SERVER MODULE, DETERMINE EXENT AND EXTENT DEADLINE
605
MIGRATE USER REQUEST, SOURCE STREAM #, CONTENT ID, NETWORK DESTINATION, EXTENT #, DEADLINE AND CURRENT TIME TO DESTINATION SERVER MOD
630
ATTEMPT TO ENTER CAROUSEL FOR CONTENT ID AND EXTENT # WITHIN DEADLINE
632
IF DEADLINE MISSED, TRY AGAIN FOR NEXT EXTENT, UP TO ONE CAROUSEL LOOP
606
VERIFY USER STILL VIEWING SAME CONTENT, DEADLINE NOT MISSED AND EXTENT #
635
MIGRATE USER RESPONSE, DESTINATION STREAM #, CONTENT ID, RETRIEVED EXTENT #, CURRENT TIME AND DEADLINE
634
ANY EXTENT RETRIEVED BEFORE DEADLINE ?
YES
NO
608
FAIL ?
YES
A
NO
610
ENABLE TRIGGER MESSAGE GENERATION (SET BIT IN EXTENT)
636
FAIL
612
WAIT FOR SERVER MODULE TO REACH END OF PRESENT EXTENT, WHEN TRIGGER MESSAGE IS GENERATED TO DISABLE OUTPUT STREAM
613
SEND HIGH PRIORITY TRIGGER MESSAGE (<ONE PACKET TIME) AND DESTINATION STREAM # TO DESTINATION SERVER MODULE
638
PROCESS TRIGGER MESSAGE AND ENABLE SPECIFIED STREAM #
640
GENERATE "STREAM MIGRATED" MESSAGE UPON START OF NEW STREAM
641
SEND "STREAM MIGRATED" MESSAGE AND STREAM # TO SOURCE SERV. MOD.
614
WAIT FOR "STREAM MIGRATED" MESSAGE FOR SHORT AMOUNT OF TIME (E.G. ONE PACKET TIME)
642
WAIT FOR CONTROL
616
STREAM MIGRATED ?
NO
TERMINATE STREAM
644
RECEIVED CONTROL ?
NO
618
YES
617
YES
636
FAIL
INDICATE TO HIGH LEVEL MANAGER THAT CONTROL PASSED
646
ACCEPT AND CONTROL USER PROVIDE CONTENT STREAMS ETC...
620
EXIT

FIG. 6